



# THE UNIVERSITY *of* EDINBURGH

## Edinburgh Research Explorer

### Material Fluidity

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# foreword

Jessamy Kelly | VICE CHAIR OF THE RAFT RESEARCH GROUP

RAFT IS A RESEARCH NETWORK THAT AIMS TO SUPPORT AND EXPLORE THE CHANGING IDENTITY OF CREATIVE PRACTICE. CHAIRED BY PROFESSOR SARAH KETTLEY AND DR JESSAMY KELLY, THE NETWORK BRINGS TOGETHER RESEARCHERS IN DIGITAL TECHNOLOGIES AND TRADITIONAL WAYS OF MAKING.

As a group, we explore how designers and makers use technologies to develop new thinking and practice. RAFT includes designers, makers, educators, curators, students, technologists and researchers from a range of material-based disciplines. Unified through our shared interest of exploring the potential of handcrafted and digital technologies, we are linked across a diverse range of material-based disciplines in order to provide peer support and interaction in the making process. The spaces between these disciplines are the places we try to pry open. We often work collaboratively on projects and connect our own developmental pathways and practices as a research cohort.

*Material Fluidity* was a joint exhibition of work presented by members of the RAFT Research Group at Edinburgh College of Art (ECA) and the Craft Cultures Research Group at Birmingham City University. The annual RAFT exhibition was showcased at the Tent Gallery at ECA from the 26th of April to the 3rd of May 2019. Works on show were presented by jewellers Stephen Bottomley, Frank Cooper, Claire Price and Timon Tio. Digitally produced textile works were presented by Collette Paterson, with a collaborative installation project from Cristina Nan, Carlos Bausa Martinez and



Dirce Medina Patatuchi. A range of mixed media works from current ECA PhD students Eleni Panourgia, Jennifer Gray and Nick Mols were shown alongside a range of kiln cast sculptural glass works from Gregory Alliss and Jessamy Kelly. In addition, a series of digitally crafted glass works were shown by Helen Pain, Alexandra Hirst, Jane Robertson, Katherine Southam, Marianne Le Gallo, Moonju Suh and Yinan Chu.

This exhibition showcased a range of work exploring the theme of fluidity from the perspective of materiality and making. The aim of the show was to create an interdisciplinary platform for discussion, to build creative insights around different approaches to materiality, through the use of craft-based knowledge and advanced digital technologies.

Material fluidity can be defined in many ways; the ability of a substance to flow easily, a material that is readily reshaped, pliable, smooth and flowing, graceful, changing or tending to change shape. The diverse materials and processes presented in this year's RAFT exhibition are testimony to the fluid and interdisciplinary approach of our members. The range of materials on show included 3D printed ceramic jewellery set with gold embellishments;



digital cut gold vinyl, 3D printed nylon jewellery, mixed media jewellery made with oxidised silver, enamel and diamond dust, recycled stainless steel watch backs and 22k gold ceramic transfers; 3D printed models lost PLA cast in kiln cast glass; textiles formed from latex and wool; 3D models cast in jesmonite and mounted on leather and slip cast porcelain, welded sheet steel, a range of moving digital images, modelled and 3D printed and finally a range of kiln cast glass sculptures made from recycled cathode-ray tube glass and lead crystal mixed with bone china aggregate. As always, it has been a pleasure to work with colleagues to co-curate such a rich and divergent platform from which to debate the future of materiality and making.

**JULY 2019**

'Pilwa' (detail). Vegetal fibre bag made by Lafkenche artisans in southern Chile. Credit: M. Cattan Lavin.



## RAFT members

RAFT HAS A DIVERSE RANGE OF MEMBERS, WORKING ACROSS A RANGE OF DISCIPLINES AND MATERIALS. HERE IS A SELECTION OF THEIR WORK.

### 01 MAGDALENA CATTAN LAVIN

Magdalena Cattan Lavin is a Chilean designer and researcher, currently based in Scotland while completing her PhD at Edinburgh College of Art, The University of Edinburgh (2016–2019/20). She holds an MA in Integrated Design from Köln International School of Design (2012) and an undergraduate degree in Industrial Design from Universidad de Chile (2007).

Since 2013, Magdalena has been a member of the academic staff of the Department of Design at the Faculty of Architecture and Urbanism in Universidad de Chile, being part of the research group "Identity and Heritage" as well as a Lecturer for the Industrial Design Seminar and Design Project courses.

### 02 CHOI KEERYONG

Her doctoral research addresses the dialogue between culturally embedded craft and contemporary design culture in the Chilean context. The thesis specifically looks into the role that design has in the commodification of crafts and critically analyses the cultural implications of this process for the artisanal communities. Through this study, she attempts to approach design practice from a critical perspective, raising a debate concerning the ethical framework of these collaborations by addressing primarily how the construction of "value" for artisans and designers echoes on prevailing dichotomies on thinking/making and innovation/tradition.

Choi completed his practice-led PhD research in 2015 at the Edinburgh College of Art, The University of Edinburgh and is currently a tutor on the ECA Master's Glass programme. His research interest lies in the notion of invented cultural authenticity, historical and symbolic meanings constructed around craft materials, how they are appreciated and how they provoke an aesthetic emotion.

Central to his artistic practice is the notion of unhomeliness. This has been explored by creating a glass object that possesses 'strangeness' as he could not find a sense of belonging within the existing (Korean or British) visual culture. His aim is to come closer to an understanding of the representation and consumption of an object and the ways that taste and value contribute to our understanding of the world by examining an individual's cultural interpretation of the glass objects he creates.



Choi Keeryong, *Dam Dah*, kiln cast glass with 9 carat gold inclusions.



## 03 SARAH KETTLEY

Professor Sarah Kettley is head of the School of Design and Chair of the RAFT research group at ECA. *An Internet of Soft Things* envisions a world in which fabrics worn, held, slept in and sat on can link us with each other, and with support networks and services essential for mental wellbeing. These soft materials allow us to communicate how we are feeling, and in turn let others communicate with us. The smart textile interfaces of *An Internet of Soft Things* offer shared experiences involving throws, pillows, and other soft furnishings, extending the vision of smart textiles beyond just the wearable garment. These objects can be networked to enable a sense of community within mental health services and could be used as part of therapeutic relationships. A team including interactive textile developers, computer scientists and psychotherapists worked with participants at Nottinghamshire Mind Network to develop physical, fabric-based objects as well as a novel methodology of co-designing such textiles and their interactions.

Credits: Sarah Kettley, Amanda Briggs-Goode, David Brown, Richard Kettley, Rachel Lucas, Martha Glazzard, Tincuta Heinzl, Matthew Bates, Stephen Battersby, Haley Berry, Nic Roberts, and the Nottinghamshire Mind Network.



## 04 DANIELA LARA ESPINOZA

Daniela Lara-Espinoza is a Chilean visual artist/embroiderer, currently a PhD candidate at Edinburgh College of Art, University of Edinburgh (sponsored by Becas Chile). She holds a Master of Arts (PUC) and a Master in Gender Studies and Culture (UCHile – sponsored by CONICYT).

Since 2010, the exposure of harmful stereotypes of women in mass media (in Chile and Latin-America) has been the focus of her work. For her PhD research, Daniela is exploring how the use of craft-related practices – with a focus on hand embroidery – could contribute to the struggle of ending violence against women in Chile and Latin America. Her bead embroideries reproduce images that derive from a process of analysing symbolic violence, misogyny, domestic violence and political discussions that concern women's rights. Through her work, Daniela explores non-violent ways to address gender-based violence and how they can provide a significant contribution to the struggle to end this phenomenon.

Daniela Lara Espinoza. 'Shoes' from the series *I treat her like a queen* (Pt.2). Bead embroidery on blue gingham fabric (2019).



## 05 LISA NAAS &amp; DAVID FALERIS

Artist/designer Lisa Naas and composer David Faleris are collaborating partners, who combine their skills and disciplines to create new works in glass and sound. They lead the *Makers Marks* project, which brings together an international group of artists, designers, composers, and engineers to explore the nature of glass through sound and engineering.

With her MFA in Glass (Edinburgh College of Art, 2015), Lisa is continuing her post-graduate work with the School of Design at ECA and currently pursuing her PhD, which focuses on the creative process. An active and versatile musician, David wears many hats as a composer: trombonist, educator, and administrator. He holds degrees from Boston College (BA Music), Peabody Institute (MM Trombone Performance) and Berklee College of Music in Valencia, Spain (MM Scoring for Film, Television, and Video Games). David and Lisa met while working at the Tanglewood Music Festival and currently reside together in Glasgow, Scotland.

Condenser microphones on a boom capture the sounds of the glass marvering technique in the ECA hotshop for the *Makers Marks* project. Credit: David Faleris, 2015.



## 06 BETTINA NISSEN

*Memento Timori* or *Data Souvenirs of Fear* are material expressions of personal moments of overcoming fears through the lens of contemporary digital society. Acknowledging the importance of overcoming life's challenges and accepting struggle and weakness as part of being human, *Memento Timori* challenges the notion of souvenirs as mementos predominantly of special occasions or joyous adventures. It is reclaiming the souvenir from consumerist representations to memorialise all aspects of human nature. Documenting our lived experiences through data tracking digital devices has become commonplace. This series of autobiographical souvenirs explores the relationship between such data and the personal experiences it aims to capture as cherished souvenirs of fears.

Dr Bettina Nissen is a designer, researcher and lecturer at the University of Edinburgh. She obtained her PhD at Newcastle University. With a background in product and interaction design, Bettina's research interest focuses on the materiality of data and how we encounter, engage or express data in material and experiential ways. Her work has been published at international conferences and her designs exhibited in Berlin, London, Milan and New York.



Bettina Nissen, *Memento Timori*, 3D printed forms enclosed within snow dome.

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07 PATRICIA WU WU

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Patricia Wu Wu is a fashion designer currently pursuing a practice-based PhD at Edinburgh College of Art, University of Edinburgh. Previously, she completed her masters in Fashion & Textiles at the Glasgow School of Art and an undergraduate degree in Textiles Design at the Arts University Bournemouth.

Her current research concerns concepts of distributing agency in response to the Anthropocene discourse. She approaches this in relation to exploring different modalities of imagining and inhabiting the body in its dynamic spatial and temporal dimension. Through practices of fictioning, which involves a heterogeneous assemblage of using algorithmic simulation, diagramming, digital fabrication and performance, she creates conceptual material expressions for the body that seek to intensify fashion towards new thresholds of perceptibility.

Prior to her research investigation, Patricia has worked at Iris Van Herpen, Derek Lawlor, as well as with textiles manufacturing firms during her placement at the Zhejiang Fashion & Textiles College in Ningbo (China), where she also taught courses on experimental material practices. She has showcased her work during Milan Design Week, Berlin Fashion Film Festival, New Designers London, the Museu Disseny Hub and Talbot Rice Gallery in Edinburgh. Her research project ‘Odradek’ was a top ten finalists for the 2018 Reshape Wearable Technology competition hosted in Barcelona.

*Odradek* 3D printed mask  
(2018). Patricia Wu Wu.

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OTHER RAFT MEMBERS

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13 ELENI-IRA PANOURGIA	See page 32



# the exhibition

*Material  
Fluidities:  
Dialogues  
Between the  
Digital and  
the Handmade*

Sarah Rothwell | CURATOR, MODERN & CONTEMPORARY DESIGN  
NATIONAL MUSEUMS SCOTLAND, EDINBURGH

THE DIVIDE BETWEEN THE  
HANDCRAFTED AND THE DIGITAL  
IS NOT AS PRESCRIPTIVE AS SOME  
WOULD LIKE TO BELIEVE.

It is in fact fluid, bouncing back and forth between the digital and the analogue,<sup>1</sup> allowing for dialogues between those with a tacit knowledge of their chosen medium, to explore and exploit advances within digital technologies. It challenges our understanding of the possibilities of materiality, achieving results that would potentially be impossible by the hand alone.

Whether it is working with the variances of computer-aided technologies or tools of manufacture that are available today, the individual designers, makers, technologists and researcher's own knowledge and intuitive skill in their chosen material's properties is essential. This is coupled with an understanding of the way digital tools and new technologies address material properties, and what happens as material tensions are augmented or released.<sup>2</sup> This allows for dialogues within material fluidities, pushing the boundaries of known tangible applications and outcomes, and

creating new discourses within art, craft and design.

These analogue and digital interfaces look to re-evaluate our understanding, by creating new works that exploit material behaviour so that in some cases "it's no longer possible to take an object at face value"<sup>3</sup> leaving the viewer uncertain as to how it was made or what from. This year's RAFT exhibition in collaboration with Craft Cultures does just this, showcasing a range of work exploring the theme of material fluidity (materiality and making). The exhibition aims to create an interdisciplinary platform of discussion and build creative insights around different approaches to materiality, through the use of craft-based knowledge and advanced digital technologies.<sup>4</sup>

There are those who work with digital applications to push the possibilities of materials to achieve new outcomes, challenging the viewers perception of how in terms of scale and intricacy of form, designers were able to achieve their vision. This is exemplified within the large-scale work of Cristina Nan (ECA ESALA), Dirce Medina Patatuchi (Heatherwick Studio), and Carlos Bausa Martínez's (Foster + Partners) a delicate vinyl installation, *Papillon D'Or*, which seemed to defy gravity.

1 p.10, Curation in the Postdigital Age, interview with Hans Ulrich Obrist, *Postdigital Artisans: Craftmanship with a New Aesthetic in Fashion, Art, Design and Architecture*, Jonathan Openshaw, Frame Publishers, Amsterdam, 2015

2 p.61, *Digital Crafting and the Challenge to Material Practices*, Mette Ramsgard Thomsen, Ed. Susan Yelavich & Barbara Adams, Bloomsbury, London, 2014

3 p.8, *Introducing Postdigital Artisans: Craftmanship with a New Aesthetic in Fashion, Art, Design and Architecture*, Jonathan Openshaw, Frame Publishers, Amsterdam, 2015

4 *Material Fluidity* interpretation panel, Edinburgh College of Art, May 2019

5 p.7, *Digital Handmade: Craftmanship in the New Industrial Revolution*, Laura Johnstone, Thames & Hudson, London, 2015

6 Grey, Jennifer, *Material Fluidity*, Edinburgh College of Art, May 2019

7 p.8, *Digital Handmade: Craftmanship in the New Industrial Revolution*, Laura Johnstone, Thames & Hudson, London, 2015

Additionally, Timon Tio's 3D-printed chain necklaces and bracelet, whose use of computer-aided technology has allowed him to explore the possibilities of jewellery manufacture that analogue alone could not achieve.

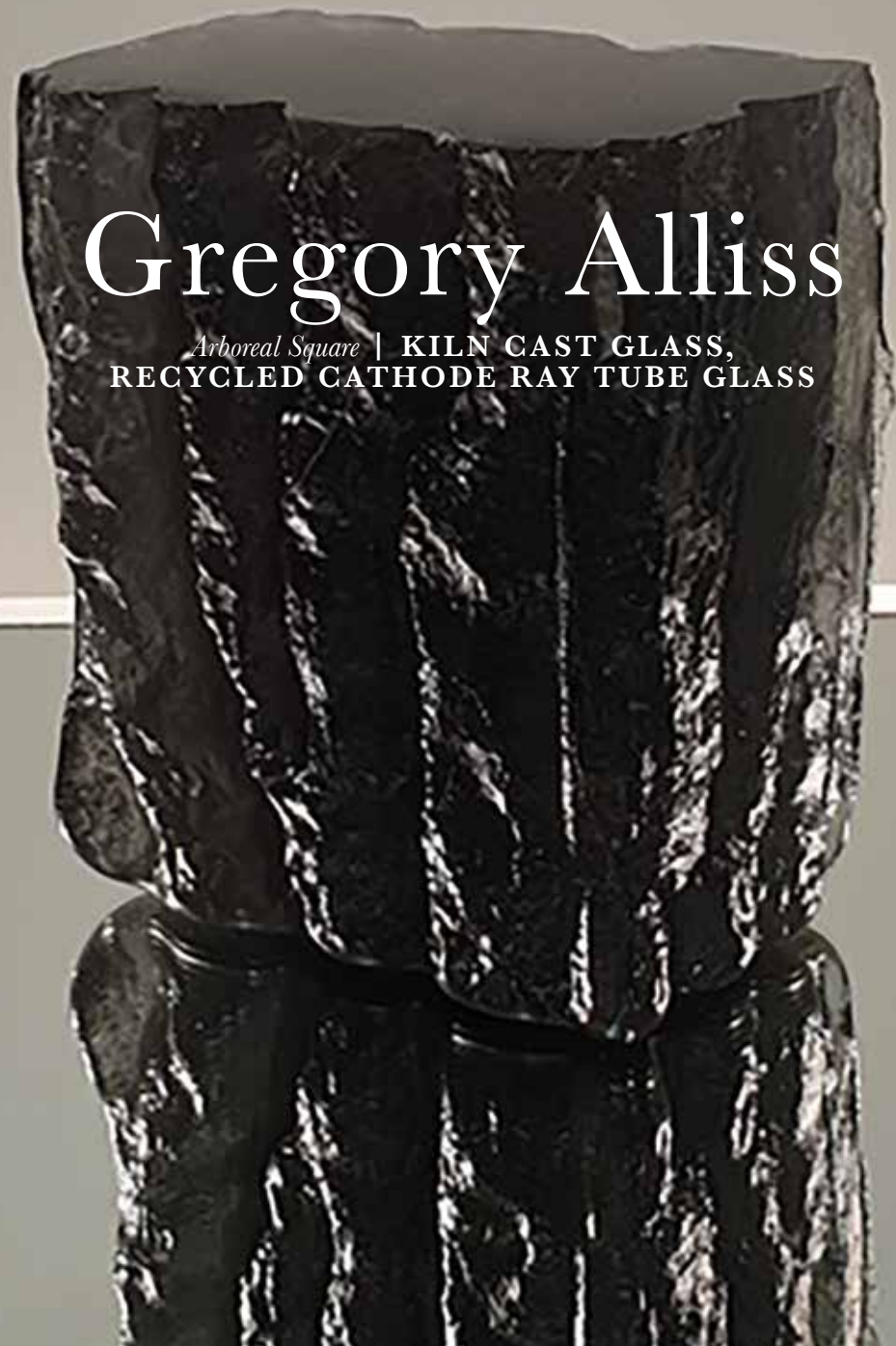
Others explore tangible material experimentation. Artists such as Gregory Alliss and Collette Paterson combine materials that are seemingly incompatible, or in some cases are deemed contaminated, to create sculptural works that with the aid of new technologies and their own material knowledge, are able to manipulate the properties of glass and textiles to create new material dialogues. The result is a series of works which, in the case of Alliss, captures transient ephemeral moments that are serendipitous results of his experiments, as seen most accurately within his enchanting cloud formations of *Trapezoid*. Whereas, Paterson's *Material Flux* is the realisation of her fusion of organic tendrils could almost be at home on the set of a sci-fi production.

In some instances, you could be forgiven for thinking the piece was completely computer rendered and then digitally printed, for example Jennifer Gray's intricately exquisite *Amphora Garlands Necklace*, where each piece was in fact created entirely by hand.

Conversely, there are others where the digital interface is not obvious at all, being lost within the making process, as with Jessamy Kelly's evocative *Glacial Mind Landscape*.

Whilst digital-aided design can create shortcuts and illusions, the designers, makers, technologists and researchers featured are producing individually crafted works of art and design that retain both the soul of the material and the skill of the human hand.<sup>5</sup> Their work is key to "demonstrating that new technological approaches, can blend quite naturally into a piece of work as a means of enhancing tradition rather than replacing it completely".<sup>6</sup> Although they are "disassembling, manipulating and reassembling the building blocks of material and form",<sup>7</sup> they do so as a fusion between hand and machine, to create truly unique works that could not have been created without their intuitive knowledge of both their craft and the digital world.

**JULY 2019**



# Gregory Alliss

*Arboreal Square* | KILN CAST GLASS,  
RECYCLED CATHODE RAY TUBE GLASS

IN 'ARBOREAL SQUARE' FAUX NATURAL TEXTURES ARE USED IN COMBINATION WITH RECYCLED WASTE GLASS FROM CATHODE RAY TUBE (CRT) TELEVISION SCREENS TO CREATE AN OBJECT THAT REPRESENTS A TREE AS IF IT WERE MAN-MADE.



The faux natural textures are mass-produced digital textures. This work has been realised using kiln cast glass techniques and then cold worked, polished and finished by hand.

*Trapped Boundaries* is twice kiln cast glass that combines conventional clear casting glass and glass from cathode ray television screens. It represents the information that flows across boundaries like the information that would flow from the television screen to the viewer referencing the source material. In combining two types of glass, this is another investigation into the limits of glass.

## BIOGRAPHY

Gregory Alliss has recently completed an MFA degree in Glass at Edinburgh College of Art. Predominantly, he works in optical glass and recycled CRT glass using kiln casting and coldworking techniques, to realise his artworks. Gregory's undergraduate and postgraduate degrees are in science and engineering. Many of his glass skills have been primarily self-taught and supplemented by short courses in glass techniques such as masterclasses at the Corning Museum of Glass, the University of Wolverhampton and the London Glass Blowing studio.



THE HEAT EXCHANGE COLLECTION UTILISES METAL FOAM DEVELOPED BY THE AEROSPACE INDUSTRY AS HEAT EXCHANGERS FOR THE DEPENDABLE EXCHANGE OF HEAT AND ENERGY.



These uniform structured cubes of metal due to their equal expansion and contraction under heat, allow for the stable fusion of diamond dust and lump enamel. The foam is then supported on a CAD designed frame 3D printed and then cast in bronze and silver for this collection for a collection of *Heat Exchangers* brooches from 2012-19.

#### BIOGRAPHY

Professor Stephen Bottomley is Head of the Birmingham Institute of Jewellery, Fashion & Textiles at Birmingham City University. He trained at the Royal College of Art (2001 MPhil), the University of Brighton (1998 MA), and West Surrey College of Art and Design (1986–89 BA). He has previously taught as a senior lecturer at Sheffield Hallam University and was Programme Director of Jewellery & Silversmithing at Edinburgh College of Art until 2017.

He is Co-chair of the 'Craft Cultures' research cluster at BCU and is a member of RAFT. Stephen is a Freeman of the Worshipful Company of Goldsmiths (2018). His jewellery is held in collections at the National Museum of Scotland, the British Museum, South East Arts and the Royal College of Art.



# Stephen Bottomley

*Heat Exchangers* | OXIDISED SILVER, ENAMEL, DIAMOND DUST



THIS SERIES OF WORK  
SHOWCASES FRANK COOPER'S  
WORK WITH A LOCAL CHARITY,  
THE ONE-HANDED MUSICAL  
INSTRUMENT TRUST (OHMI).



The work was undertaken at the School of Jewellery, at the Birmingham City University to democratise access to and improve the design and manufacture of a descant recorder that has been developed for use by disabled young people wishing to engage in a meaningful way with music.

The challenge was to modify the existing design of a traditionally manufactured, and essentially handmade, wood and brass recorder so that it could be 3D-printed (anywhere in the world) and easily assembled by a person unskilled in music instrument making.

BIOGRAPHY

Frank Cooper is a jewellery industry professional, Senior Lecturer in Jewellery Manufacturing Technologies and Manager of the Centre for Digital Design and Manufacturing at the Birmingham School of Jewellery, a position he has held since 2003.

He is a globally recognised expert in the use and application of various Additive Manufacturing and prototyping/3D-printing technologies used in the jewellery manufacturing industry. His papers and presentations currently specialises primarily in the areas of Additive Manufacturing, CAD and prototyping for the jewellery and silversmithing industries.

Two intermediate stage  
3D printed assemblies with  
modified lever ball and socket  
arrangements for testing.



# Frank Cooper

Descant recorder | BETA TEST VERSION 3D PRINTED ASSEMBLIES





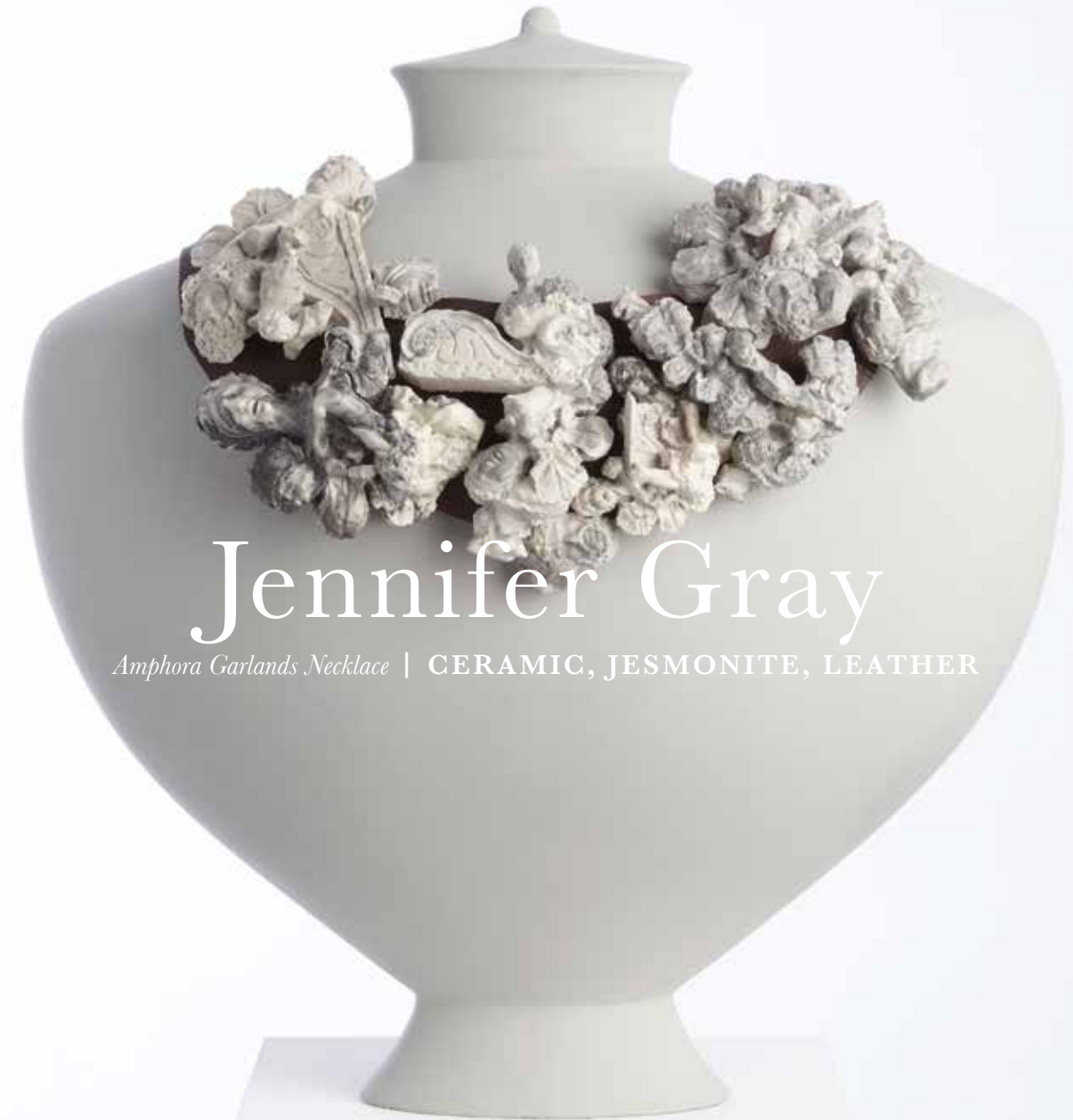
'AMPHORA GARLANDS' GIVES THE WEARER THE EXPERIENCE OF REMOVING A STONE GARLAND FROM A CLASSICAL CERAMIC URN AND USING IT TO ADORN THEMSELVES.

When the stone garland is not being worn on the body it is placed back on the classical urn to reinstate it as a sculptural ornament. Jennifer's *Amphora Garlands* series is inspired by her visits to the Sir John Soane Museum in London. The museum houses a vast and wide-ranging, eclectic collection of art and artefacts collected by Soane on his European tours. Using the same method as in most of her projects, these stories are researched and brought into a contemporary setting through their re-imagining.

#### BIOGRAPHY

Jennifer Gray is a Glasgow-based designer/maker and Programme Director of Jewellery & Silversmithing at Edinburgh College of Art, University of Edinburgh. She is a graduate of the Glasgow School of Art and the Royal College of Art. Currently, she is exploring through her doctoral studies, how processes of re-making and reconstruction can foster new perspectives on historical objects.

Her works are produced in a range of materials using techniques, which move in and out of the hand-made and the digital. Her works are sold and exhibited internationally.





INSPIRED BY THE CHINESE APPROACH TO MIND LANDSCAPE PAINTING, THIS SERIES OF WORK RELATES TO THE ACT OF CREATING A LANDSCAPE FROM THE MIND.



This work was initially free-modelled from digital models of glacial forms which were used as reference, silicon moulds and then wax models were made. The final forms were created in the lost wax glass casting technique, as the glass is melted into the mould it mixes spontaneously without control, as if mixed in the mind, freely forming rivulets of blended colour and form.

A mix of copper cobalt and opaline white kiln cast glass, mixed with high fired bone china ceramic aggregate was used. Solid in form, they have been cold-worked, sandblasted, diamond cut and brush polished.

#### BIOGRAPHY

Jessamy Kelly is an Edinburgh-based glass artist and designer. Her work has been exhibited widely throughout the UK as well as internationally. She holds a BA (Hons) in Glass and Ceramics from the University of Sunderland and a Master in Glass at Edinburgh College of Art. In 2009, she completed her practice-based PhD at the University of Sunderland.

She is currently a Lecturer and Programme Director of Glass at Edinburgh College of Art and is Vice Chair of the RAFT research group.



# Jessamy Kelly

*Glacial Mind Landscape* | CRYSTAL & HIGH FIRED BONE CHINA  
CERAMIC AGGREGATE, KILN CAST GLASS SCULPTURE

MARIANNE LE GALLO'S PRACTICE AND RESEARCH FOCUSES ON IDENTITY, DISPLACEMENT, BOUNDARIES, THE UNCANNY AND A DESIRE TO MINIMISE WASTE WHENEVER POSSIBLE BY REPURPOSING AND RE-CONTEXTUALISING OBJECTS.



**B**y reusing waste materials such as bottle glass, her work shifts from the ready-made to the remake-able. For this series she created 3D printed forms in PLA (polylactic acid), an organic material, which is lost organic-cast (burnt out) of the mould. Glass is then cast into the cavity to create a variety of kiln cast glass forms, cold worked and highly polished to finish.

#### BIOGRAPHY

Marianne graduated with a BA (Hons) degree in Art History from University College London in 1998, and a BA in Fine Art from Duncan of Jordanstone College of Art & Design, in 2018. She is currently studying towards her MFA in Glass at ECA. She is motivated by the interdisciplinary environment at ECA, which she uses to challenge and test disciplinary boundaries. She aims to produce work which confounds the institutional and cultural boundaries existing between art, design and craft. She is interested in raising awareness around issues of sustainability and the use of recyclable materials, positively impacting the environment and the communities she is part of.

# Marianne Le Gallo

*Fit Bottle* | KILN CAST GLASS MADE FROM RECYCLED GORDON'S GIN BOTTLE, LOST PLA CAST FROM A 3D-PRINTED DIGITAL MODEL



'SKEUOMORPH FANTASIA' (2018) ADDRESSES THE ISSUES OF THE DIGITAL COPY, THE DIGITAL REPRODUCTION AND OF THE DIGITAL CREATION AND CREATES ITS OWN REALITY THROUGH THE SKEUOMORPHIC AND FANTASIA.

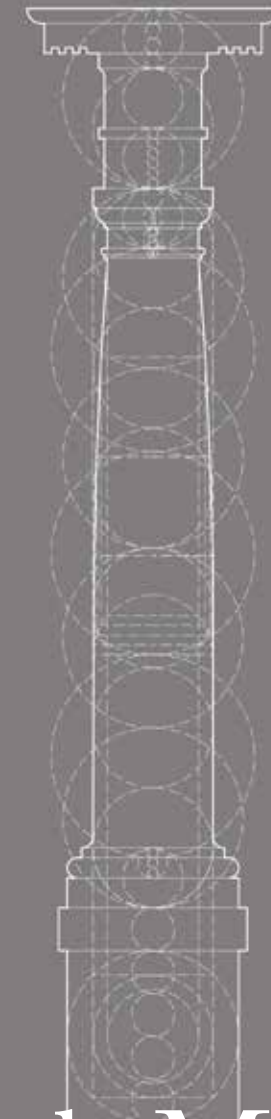
**I**t can be observed, yet not touched, and is only apprehensible in motion. *Kronian Dematerialisation* (2018) aims to outline the correlation of creation and destruction in the process-of-making of digital representations. *Proportional Emulation* (2019) forms part of a research which aims to understand proportional compositions of edifices in order to track the dissemination and reception of the work of Sebastiano Serlio.



#### BIOGRAPHY

Nick Mols researches the dissemination of Sebastiano Serlio's architectural mathematics through a digital practice of drawing history. This is done through connecting architectural heritage and paper architecture with architectural theory through mathematical drawing.

Nick read Architecture at the University of Antwerp and Architectural History at the University of Oxford and is currently undertaking a PhD in architecture at the University of Edinburgh. He is recipient of a Da Vinci Scholarship, and the SGSAH-AHRC Studentship. He has also participated at symposia for the Biennale of Venice (2014) and Kanal-Centre Pompidou in Brussels (2018).

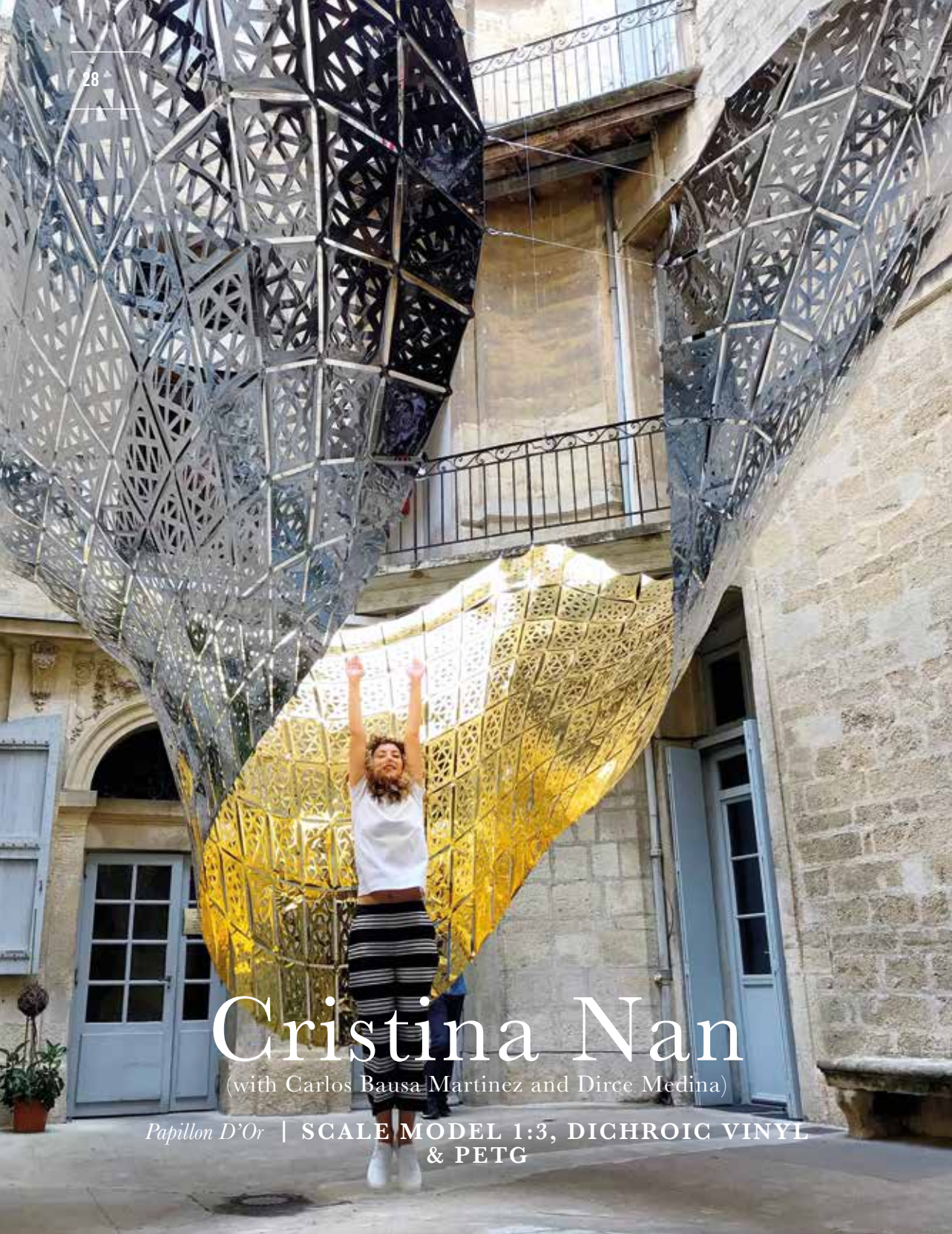


# Nick Mols

*Proportional Emulation* | MOVING DIGITAL IMAGES,  
3D MODELLED AND PRINTED FORM







# Cristina Nan

(with Carlos Bausa Martinez and Dirce Medina)

*Papillon D'Or* | SCALE MODEL 1:3, DICHROIC VINYL  
& PETG

THE INSTALLATION PAPILLON D'OR HAS BEEN DEVELOPED AND DESIGNED FOR THE FESTIVAL OF ARCHITECTURE 2019 IN MONTPELLIER, BY A DESIGN TEAM MADE UP OF CRISTINA NAN (ECA ESALA), DIRCE MEDINA PATATUCHI (HEATHERWICK STUDIO), CARLOS BAUSA MARTINEZ (FOSTER + PARTNERS).



The exhibited model is a scale model in 1:3 of the actual installations built for the Festival. Whereas the final proto-structure was fabricated out of dichroic vinyl and PETG, the scale model exhibited was made out of 180 components, in 220gsm paper. The individual components are joined together by metallic fasteners.

## BIOGRAPHY

Cristina Nan is a Lecturer in Digital Fabrication and Design at ESALA, at ECA. She studied architecture at the Technical University Munich and the University of Bath. She completed her PhD at the HafenCity University in Hamburg, while also participating at the Open Thesis Fabrication Programme of the IAAC Institute in Barcelona. She is a member of RAFT.

Cristina has worked in a series of architectural practices in Munich and Hamburg. She explores algorithmic design, digital fabrication and material systems as interdependent parameters in order to support the design process and the further evolution of the discipline.





THIS SERIES OF WORK RESULTED FROM AN EXPLORATION OF THE EFFECTS OF COMBINING EXISTING 3D DIGITAL MODELS TO MAKE NEW OBJECTS.

The *Scan the World* initiative provides an ever-expanding collection of 3D digital models of artefacts, providing public access to culturally significant objects, which can be freely downloaded. These are then 3D printed in poly-lactic acid (PLA) and then investment moulded in plaster and flint. The PLA is then burnt out leaving a cavity into which the glass can be cast, the work is then cold worked and finished by hand.

The first piece combines a *Penguin with a Fledgling* (credit Vasily Vatagin) and A “*Winged*” *Ammonite*. The second piece combined these with a third model, *Penguin* (credit Louis Odette). In exploring 3D print technology by combining various digital models, the penguins and ammonite have been fitted together in mesh mixer.



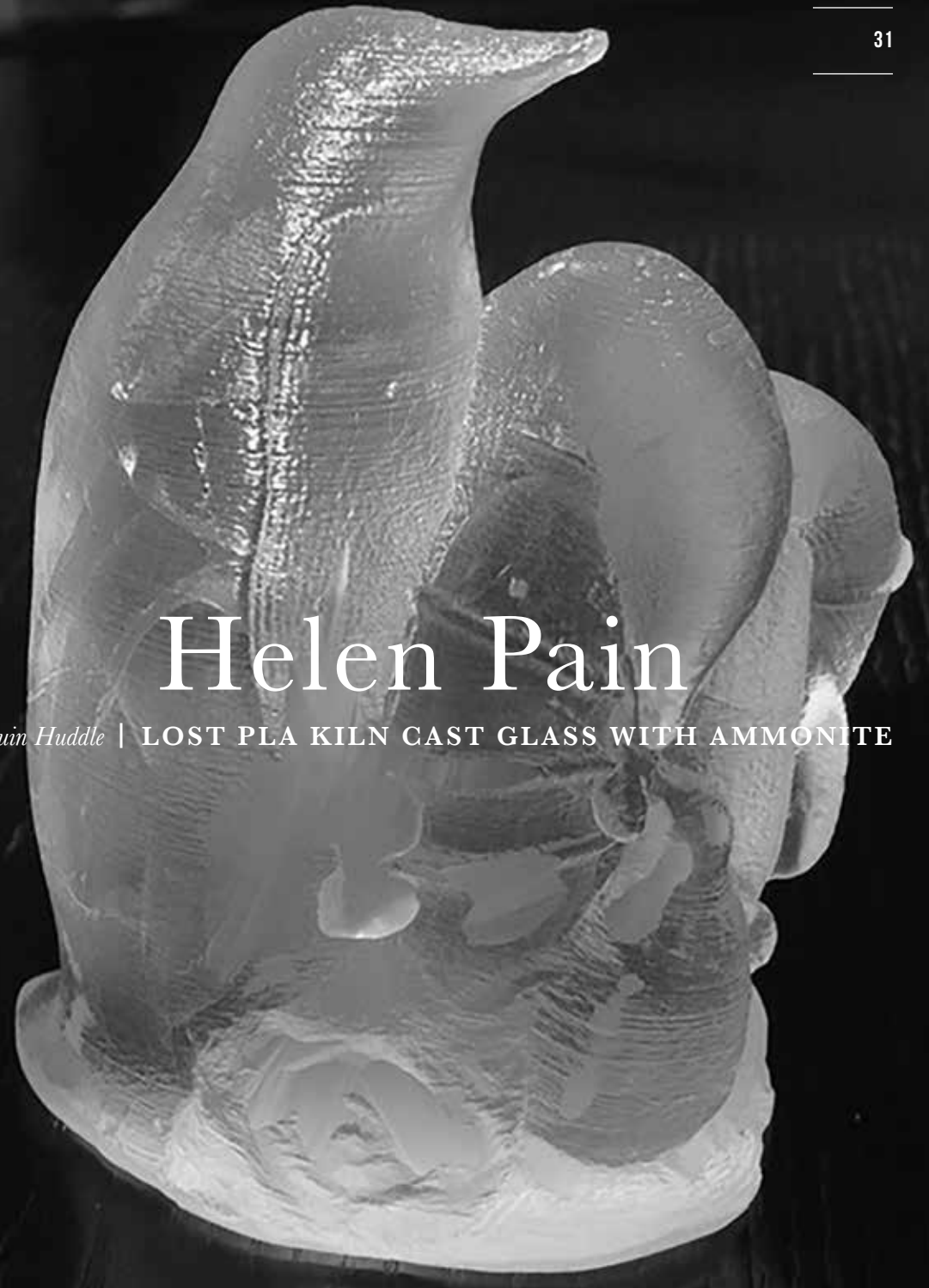
#### BIOGRAPHY

Helen Pain researches and teaches in Interaction Design, within Design Informatics at the University of Edinburgh. She uses participatory design to develop interactive, multimedia technology and game-like environments that engage learners with special needs in play and exploration, working with children and practitioners.

She is currently exploring and expanding her knowledge of design processes, through creative practice, in relation to Glass and Textiles, and is enrolled on the ‘Digital Crafting in Glass’ elective run by the ECA Glass Programme.

# Helen Pain

*Penguin Huddle* | LOST PLA KILN CAST GLASS WITH AMMONITE





# Eleni-Ira Panourgia

*Process / Procedure* | STEEL SCULPTURAL OBJECTS

PROCESS/PROCEDURE' IS A NINE-HOUR PERFORMANCE-INSTALLATION OF CO-COMPOSITION, A PROCESS DURING WHICH PHYSICAL AND SONIC MATERIAL ARE CONCURRENTLY PRODUCED, REARRANGED AND TRANSFORMED.

Central to this work is the idea of process, which is viewed in relation to actions of sculpture making, the sounds of the making and their digital manipulation. The work takes the form of an installation consisting of the products of co-composition: an excerpt of video documentation of the performative event and its live sound together with nine sculptural objects.

The aim of this post-performance setting is to show the interdependent relationships between actions, materials and modalities, an approach that brings together physical processes of welding, grinding and cutting steel and digital sound processing within an interactive environment.

## BIOGRAPHY

Eleni-Ira Panourgia recently completed a PhD in Art at the University of Edinburgh as a scholar of the Onassis Foundation. She is a Teaching Fellow at the University of Edinburgh. Eleni-Ira's work focuses on intersections of visual-spatial and temporal dimensions in a responsive and interactive way in relation to materials, their processes and technologies.

She is a member of 'Greek Sculptors' Association, the Chamber of Fine Arts of Greece and RAFT. She is co-founder of SIREN research network and co-founder and managing editor of Airea Journal.



MATERIAL FLUX ARE THE PRODUCT OF A MATERIAL AND PROPERTY-DRIVEN INVESTIGATION TO FUSE THE QUALITIES INHERENT INITIALLY IN LATEX AND WOOL, WITH THE ADDITIONAL CONSIDERATION OF OTHER PINPOINTED, WEIGHTED ELEMENTS TO BALANCE AND UNBALANCE THE FORMS.



Structural and growing forms show the fusion of pure material qualities to result in new qualities and material propositions, without contextual drivers or product definitions. The new qualities are layered, stacked, bulky, fluid, fused and fixed. There is no addition of glues or adhesives and the blending of materials are in their purest forms.

#### BIOGRAPHY

Collette Paterson is a Lecturer in Design (Textiles) at ECA and a PhD candidate at Heriot-Watt University and a member of RAFT. She is also a Visiting Tutor at DJCAD, University of Dundee, inputting across Critical Making and Textiles areas. Collette is a Royal College of Art, MA graduate with a material interest in mixed-media and material manipulation techniques.

Collette lived and worked in Shanghai, PR China for more than 5 years, writing, directing and delivering UK-validated Fashion Design degrees to large Chinese and International cohorts. Her PhD research reflects on the recent growth of fashion and design education in China, evaluating its future prospects and key drivers.



# Colette Paterson

*Material Flux* | 3D PRINTED DIRECT CERAMIC ADDITIVE  
LINEAR TEXTURED CERAMIC WITH GOLD





# Claire Price

*Valentine series* | 3D PRINTED DIRECT CERAMIC ADDITIVE,  
LINEAR TEXTURED CERAMIC WITH GOLD



CLAIRE IS INSPIRED BY THE DESIGN POTENTIAL FOR 3D PRINTING AND THE OPPORTUNITIES THAT COMPUTER AIDED DESIGN AND DIGITAL MANUFACTURING PROCESSES OFFER.

She explores form and texture through a variety of material applications creating wearable and functional products that reflect the relationships between loved ones. This body of work explores the possibilities of ceramic additive manufacturing.

The fragile appearance yet durable quality of the material, enhanced with 18ct gold detail, creates a preciousness, inherent in a luxury product. Claire continues to explore this technology in a commercial context, testing the level of detail and tolerances of the material whilst developing tactile forms and textures which are pleasing to the consumer, resulting in heirlooms that portray a sense of romanticism through the symbolism, material choice and colour palette of the jewellery.

## BIOGRAPHY

Claire Price is course director of the BA Jewellery Design for Industry Course at the School of Jewellery in Birmingham. Prior to teaching, Claire worked as a jewellery designer within the industry which allowed her to explore the capabilities of computer aided design and develop skills and knowledge of production processes used for the manufacture of precious jewellery.



THIS SERIES OF WORK EXPLORES THE POSSIBILITIES OF NYLON 3D PRINTING TO CREATE LIGHTWEIGHT STATEMENT CHAIN PIECES.

**T**imon's collection merges industrial digital processes with traditional hand-making techniques as an innovative approach to contemporary fashion jewellery. The pieces are 3D printed in nylon, polished, dyed and assembled with other components before each chain link is filled with cold enamel, resulting in a distinctive silhouette.



#### BIOGRAPHY

Timon Tio is a Birmingham-based jewellery designer combining digital manufacturing with traditional techniques. Initially trained in product design in Brazil, he moved to the UK to complete a BA in Jewellery & Silversmithing at Birmingham School of Jewellery in 2017, where he is currently based as an Artist in Residence. His aesthetic approach is inspired by functional objects and mechanisms, reinterpreting industrial elements in the context of jewellery.



# Timon Tio

*Super Chunky Necklace* | 3D PRINTED NYLON & COLD ENAMEL



# Masters Students

Yinan Chu, Marianne Le Gallo, Alexandra Hirst,  
Jane Robertson, Katherine Southam & Moonju Suh



THE CRAFT OF THE DIGITAL HAND PROJECT BRIEF WAS RUN BY LECTURER AND RAFT MEMBER GEOFFREY MANN. THIS PROJECT EXPOSED ECA GLASS MASTERS STUDENTS TO A SERIES OF DISRUPTIVE TECHNOLOGIES THAT SUPPORT, CHALLENGE AND EXPAND THE KNOWN PROPERTIES OF GLASS.

A series of process-led workshops provided students with 'new digital tools' which they were asked to apply to their creative glass practice. The aim of the project was to empower the students with accessible tools, traditional and digital, that can be embedded to support the creative process.

The software they worked with was a combination of Rhino, Meshmixer, Slicer for Fusion 360 and Autodesk Netfabb. They created 3D-printed forms in PLA (polylactic acid), an organic material, which was lost organic cast (burnt out) of the mould. Glass was then cast into the cavity to create a variety of kiln cast glass forms.

## BIOGRAPHY

The award-winning Glass Masters Programme at ECA explores glass as a design tool that encourages process-led risk and play, in parallel with the prototyping and resolution of designed objects. Student's focus on the materiality of glass, exploring new boundaries through the integrated relationship between process and theory, and are encouraged to position themselves within and beyond the disciplines of glass.

*The Craft of the Digital Hand,*  
lost PLA kiln cast glass.  
Katherine Southam.





Lichen Safari at the Royal Botanical Garden.  
Credit: Patricia Wu Wu.

# workshops

IN NOVEMBER 2018 AT ONE OF THE MONTHLY RAFT MEETINGS, THE IDEA OF A RAFT-EVENT BASED ON THE FLUIDITY OF MATERIALITY AND MAKING EMERGED WHILE DISCUSSING THE GROUP'S UPCOMING EXHIBITION FOR THE SPRING OF 2019.

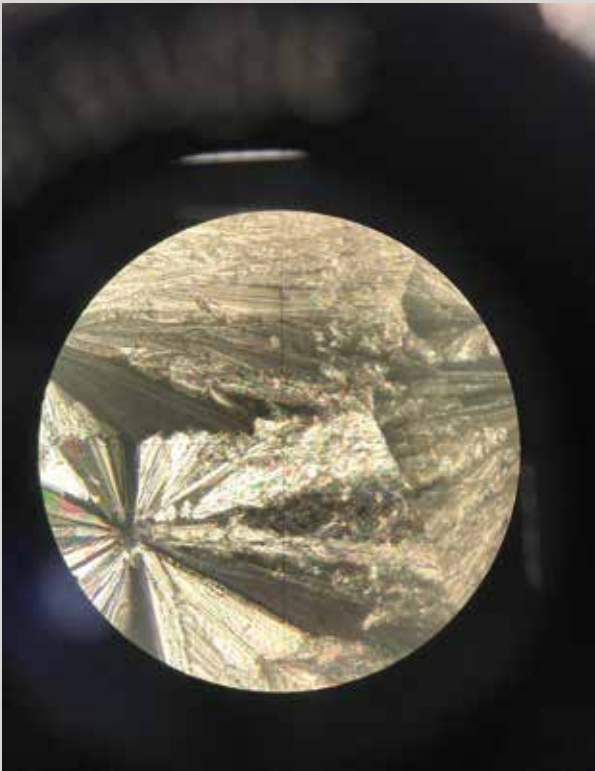
To complement this project, three members of the RAFT Network – PhD candidates Magdalena Cattán Lavín, Patricia Wu Wu and Daniela Lara-Espinoza – together with the support of RAFT's Vice-Chair Jessamy Kelly, decided to propose a series of workshops. The idea was based on the need for ECA PGR students to share their work with their peers and with other practitioners who might be interested in their research. Because the intensity and specificity of PGR work can often be isolating, opportunities to create connections with different audiences are needed, together with the encouragement for possible collaborations and constructive discussions within and beyond the RAFT research group.

The 2019 RAFT events were organised, to complement each other, including the *Material Fluidity* exhibition and associated Mini-Symposium and a series of four workshops hosted by ECA's staff and PhD students.

Workshop series posters.



Ascorbic acid crystal on the microscope.  
Credit: Magdalena Cattán Lavín.



The project was funded by ECA's Devolved Researcher Fund.

The first workshop, *Fungi All Around: Treasure Hunt for Lichens at the Royal Botanic Garden of Edinburgh*, was hosted by PhD student Carole Papion. The second workshop, *Crafting a Digital Object*, was co-hosted by Dr Martin Parker and Dr Eleni-Ira Panourgia. The *Natural / Synthetic / Emergent: Crystallography* workshop was hosted by PhD researcher Waad AlBawardi and held at ASCUS Lab. Finally, the fourth workshop, *Craftivism: Craft-related Practices Combined with Non-violent Activism*, was hosted by PhD researcher Daniela Lara-Espinoza.

Designed to complement the exhibition's theme, these four workshops created an interdisciplinary platform to explore different approaches to materiality and making.



The Royal Botanical Garden Edinburgh, was an exceptional environment to run this workshop.  
Credit: Daniela Lara Espinoza.

Drawing was encouraged to recognise the diverse textures of the lichens.  
Credit: Daniela Lara Espinoza.



## 01 FUNGI ALL AROUND WORKSHOP

A treasure hunt for lichens at the Royal Botanic Garden.

This workshop was focused on how we encounter fungi in this daily environment, by meeting with the lichens of the Botanic Garden of Edinburgh. Lichens are ubiquitous to urban surfaces but largely overlooked.

Participants were invited to search, observe their environment, look closer at their texture, describe and depict specimens, name and remember them. This playful and experimental morning with lichens was intended to open up participants' attention and creativity.

It was recommended to bring a camera. Paper and pencils were provided, and participants were asked to bring whatever seemed suitable to record their experience.

### HOST

Carole Papion is a PhD student from the School of Design, at Edinburgh College of Art. Her research is committed to understanding perceptions and interactions with fungal specimens, and more largely transform our relationships towards more care for non-human city dwellers.

## 02 CRAFTING A DIGITAL OBJECT WORKSHOP

Using Raspberry Pi and some simple sensors, participants of this workshop explored how the shape and form of objects can inform how we might construct code and behaviour in the digital domain.

This workshop showed the participants how an object can express itself via digital layers and mechanisms. They used some prebuilt Python scripts to get information from the Raspberry Pi to other computers and software. Some of the participants soldered sensors together and sculpted objects to explore the influences of the way code is designed. They also experimented with sound and visual software languages like Pure Data and MaxMSP and the Unity Game Engine. No previous experience of Raspberry Pi or coding was required for this workshop.

Workshop participant assembling a Raspberry Pi.  
Credit: Eleni-Ira Panourgia.



### HOSTS

Dr Martin Parker studied composition at the University of Manchester and completed a PhD in Composition at the University of Edinburgh in 2003. He is Academic Director of the University of Edinburgh's MSc in Sound Design. His work focuses on encounters between computers, people and places. Based in Edinburgh, he has performed and collaborated internationally with theatre companies, symphony orchestras, visual artists and ensembles.

Dr Eleni-Ira Panourgia is an artist and tutor at Edinburgh College of Art, University of Edinburgh. She is currently working on the development of multi-modal creative processes that combine sculptural/three-dimensional objects and sound. Eleni-Ira holds an integrated Masters Degree in Sculpture and Visual Arts (2014) from Athens School of Art and the École Nationale Supérieure des Beaux-Arts de Paris, where she studied as an exchange student (2012–13).



Dr Martin Parker guiding the first workshop session.  
Credit: Eleni-Ira Panourgia.



Detail of a crystal sample made with ascorbic acid and blue pigment.  
Credit: Magdalena Cattán Lavín.



### 03 CRYSTALLOGRAPHY WORKSHOP

For this workshop, the participants created their own microscopic crystalline compositions under the guidance of molecular biologist and crystallography artist Waad Albawardi. They also received insight into the natural and synthetic crystals that exist all around us. Participants learned more about how crystals form, their growth habit, their dynamic properties and their inherent versatility.

During the workshop participants made their own synthetic crystals in ASCUS Lab. They learned how to use temperature, chemical interactions and physical intervention to define the resulting emergent properties, and capture their own emerging crystalline compositions under the microscope.

The workshop participants observe crystalline compositions through the microscope.  
Credit: Cathe Desiree S. Nadal.



#### HOST

Waad AlBawardi is a molecular biology researcher at the University of Edinburgh studying the process of DNA packaging inside cells. Beyond scientific research, she is interested in examining natural phenomena through creative lenses. She uses microscopy techniques to explore themes of emergence, complex systems, organizational scales, and natural forms. Her recent work includes Interplanetary eXplorer, a collaborative project contemplating the relationship between the microscopic and the universal. Her work has appeared in MIMA, Site Gallery, and Qahwa Project.

ASCUS Art & Science is a non-profit volunteer organisation. Founded in 2008, they are an organisation dedicated to building a community of artists, designers, scientists, and other individuals interested in how art, design and science can engage new and wider audiences for both fields. They believe art, design and the sciences are innovative fields that can benefit from exposure to a diversity of ideas. They want to foster unconventional thinking and build appreciation for, and participation in, the intersection between art, design, science, and related fields. ASCUS is based in Edinburgh, but serves as an established hub between like-minded organisations both nationally and internationally.

Detail of the materials used for the Craftivism workshop.  
Credit: Daniela Lara Espinoza.



### 04 CRAFTIVISM WORKSHOP

Craft-related practices combined with non-violent activism.

This workshop proposed to use craft-related techniques such as sewing, knitting, quilting, applique, etc. for the creation of artworks. The aim was to refer to socio-political issues related to the participants' specific interests (climate change, homelessness, unemployment, depression, gender matters, etc.), materialising these concerns into craft-related artworks.

Some simple stitching practices were taught, as required by the participants. No specific skills were necessary and all materials were provided. The workshop was divided into two days. The first session was focused on discussions, drafts and outlines of the artworks, with an emphasis on materials and techniques required for each project. For the second session, the participants continued to work on their projects, receiving assistance when needed.

#### HOST

Daniela Lara-Espinoza is a Chilean visual artist/embroiderer. She is currently a practice-based PhD researcher at ECA. Her main artistic practice is bead embroidery and her research is focused on how to use textile art – with a focus on hand embroidery – as a tool to confront violence against women.



A workshop participant re-threading a needle to continue with her stitching.  
Credit: Daniela Lara Espinoza.



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